Speed Limits and Setting State Speed Zones

Traffic Safety Series

Speed Panel

December 09, 2020

New Hampshire DOT
Department of Transportation

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Bureau of Traffic

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Overview/Objectives

- Review of Relevant Speed Limit Statutes
- Determining State Speed Zones
- Setting Credible Speed Limits
- Recent New Hampshire case studies
- Speed limit relationship with other traffic control devices

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Review of Relevant Speed Limit Statutes

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Review of Relevant Speed Limit Statutes

- RSA 265:60 Basic Rule and Maximum Limits
  - Establishes the “reasonable and prudent” standard
    - “No person shall drive a vehicle on a way at a speed greater than is reasonable and prudent under the conditions and having regard to the actual and potential hazards then existing.”

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Review of Relevant Speed Limit Statutes

- RSA 265:60, cont'd
  - "In every event speed shall be so controlled as may be necessary to avoid colliding with any person, vehicle, or other conveyance on or entering the way in compliance with the legal requirements and the duty of all persons to use due care."

Review of Relevant Speed Limit Statutes

- RSA 265:60, cont'd
  - Defines school zone speed limit
  - 30 mph for business or urban residence district
  - 35 mph for rural residence district and Class V highways (a.k.a. "town roads")
  - 65 mph for interstates, turnpikes, and other multi-lane, divided highways, except I-93 north of Concord (70 mph)
  - 55 mph in other locations

Review of Relevant Speed Limit Statutes

- RSA 265:62 Establishment of State Speed Zones
  - Requires an engineering and traffic investigation
  - Statute does not define “engineering and traffic investigation
  - NHDOT follows accepted traffic engineering practice

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Review of Relevant Speed Limit Statutes

- Manual on Uniform Traffic Control Devices (MUTCD)
  - MUTCD, national standard for all traffic control devices requires that “speed zones (other than statutory speed limit) shall only be established on the basis of an engineering study that…shall include an analysis of the current speed distribution of free-flowing vehicles.”
  - Recommends that “when a speed limit within a speed zone is posted, it should be within 5 mph of the 85th percentile speed of free-flowing vehicles

Determining State Speed Zones

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Determining State Speed Zones

- Components of an “engineering and traffic investigation”
  - Speed study
  - Horizontal and vertical geometry
  - Traffic volume and crash history
  - Segment length
  - Number of lanes and lane width
  - Offset to hazards

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Engineering and Traffic Investigation

- 85th percentile speed
  - Based on research by David Solomon, US Bureau of Public Roads (now FHWA)
  - Compares the relationship between average speed and collision rates of automobiles
  - Generally regarded as the “reasonable and prudent” standard with regard to speed limits

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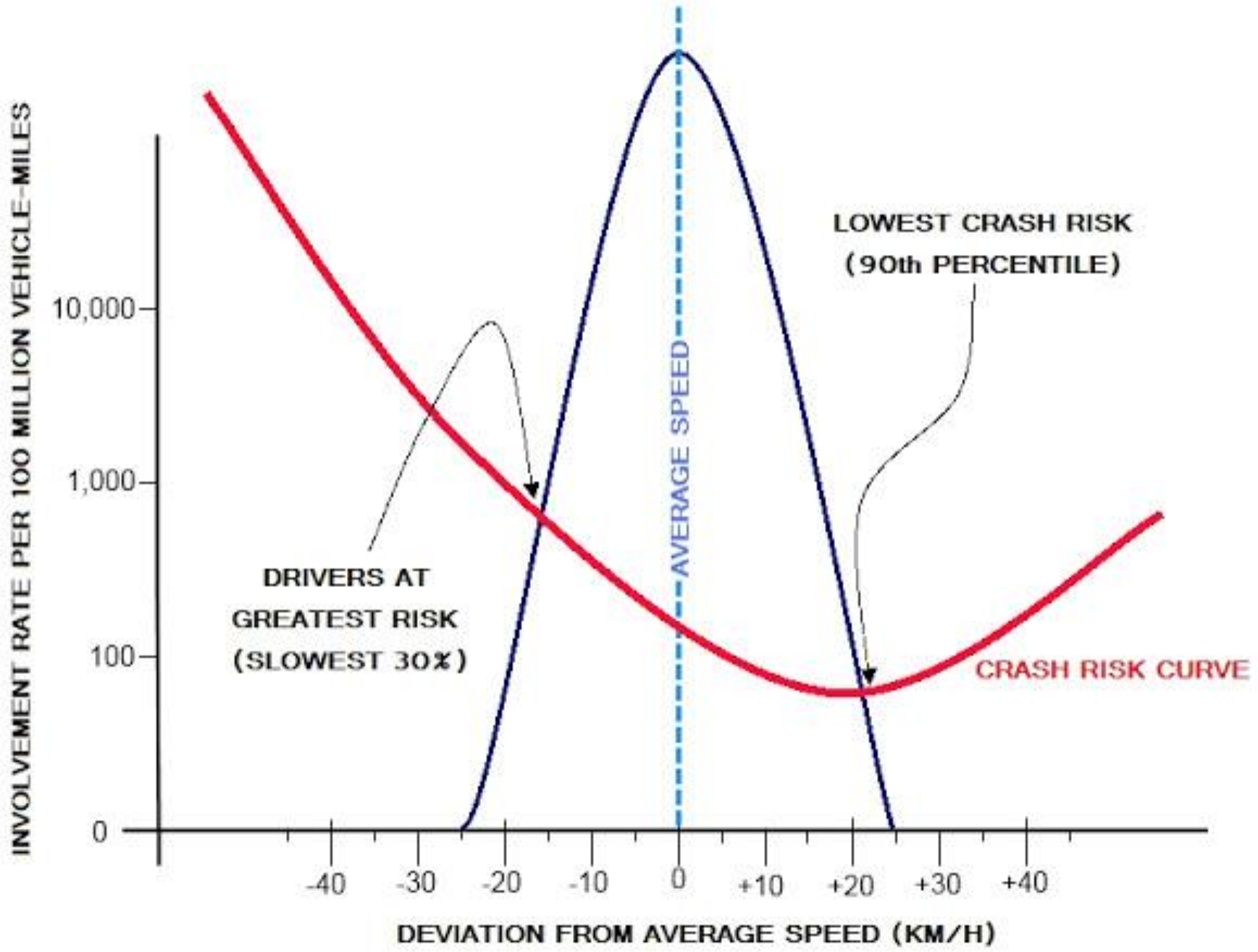
INVOLVEMENT RATE PER 100 MILLION VEHICLE-MILES
10,000
1,000
100
0
LOWEST CRASH RISK
(90th PERCENTILE)
AVERAGE SPEED
DRIVERS AT
GREATEST RISK
(SLOWEST 30%)
CRASH RISK CURVE
-40
-30
-20
-10
0
+10
+20
+30
+40
DEVIATION FROM AVERAGE SPEED (KM/H)

Engineering and Traffic Investigation

- Other factors:
  - Crash history compared to similar segments
  - Highway geometry: design speed does not necessarily relate to posted speed limit
  - Continuity with neighboring speed zones and length of segment relates to credibility
- USLIMITS2, web-based program developed by FHWA
  - Used to validate engineering and traffic investigation

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Setting Credible Speed Limits

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Setting Credible Speed Limits

- Individual drivers control their speed according to perceived and actual road conditions, most (85% +/-) are “reasonable and prudent”
- Posted speed limits indicate the maximum legal speed for a specific roadway segment
- Unreasonably low speed limits are not respected by drivers, law enforcement, or the courts
- Other elements, including curve warning signs and passing zones, are determined based on posted speed limit

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What is the Speed "Limit"?

Or

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Setting Credible Speed Limits

- Lowering speed limits does not result in lower speeds
  - Candia, NH 27 near Charmingfare Farm
  - Hooksett, US 3/NH 28 toward Allenstown
  - Wakefield, NH 153 north of “village”
  - Lincoln-Livermore, NH 112 (the “Kanc”)
  - Hancock, US 202
  - Wilmot, NH 4A

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Recent New Hampshire Case Studies

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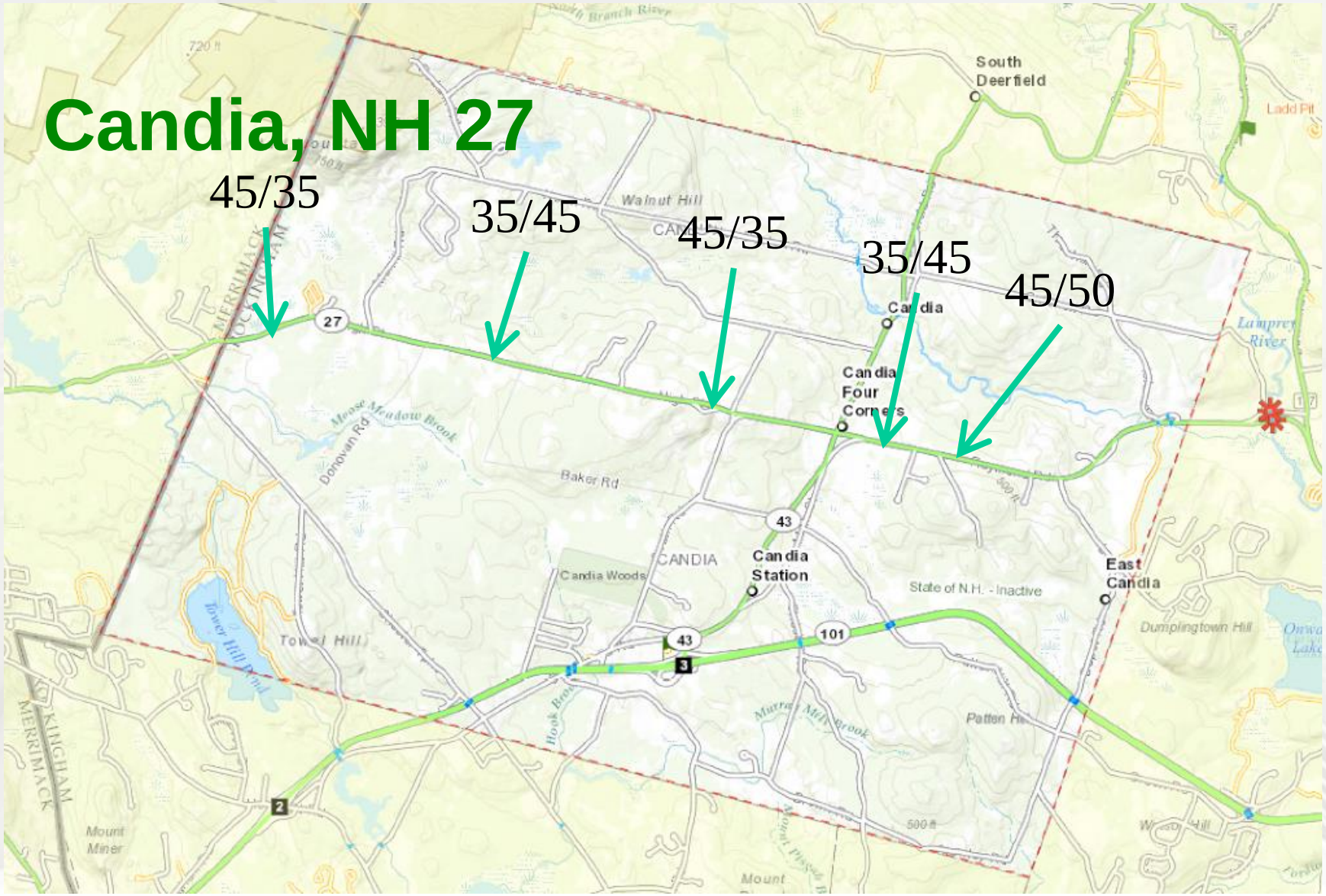
Candia, NH 27
45/35
35/45
45/35
35/45
45/50
South Deerfield
Walnut Hill
Candia
Candia Four Corners
Baker Rd
Donovan Rd
Moose Meadow Brook
CANDIA
Candia Station
Candia Woods
East Candia
State of N.H. - Inactive
Dumplingtown Hill
Tower Hill Pond
Tower Hill
Hook Brook
Murray Mill Brook
Patten Hill
Mount Miner
Mount Pisgah
Lamprey River
Ladd Pit
MERRIMACK
KINGSTON
27
43
101
3
2

Candia, NH Route 27 Traffic and Engineering Investigation

Table 1 - Speed Summary Data
Candia - NH 27, east of Charmingfare Farm

Measurement	EB	WB	Combined
Observations	5,935	5,555	11,490
Average Speed	42 mph	43 mph	42 mph
50th Percentile Speed	42 mph	43 mph	42 mph
85th Percentile Speed	**47 mph**	**48 mph**	**48 mph**
10 mph pace	35-45 mph	40-50 mph	35-45 mph
Posted Speed Limit	35 mph	35 mph	--

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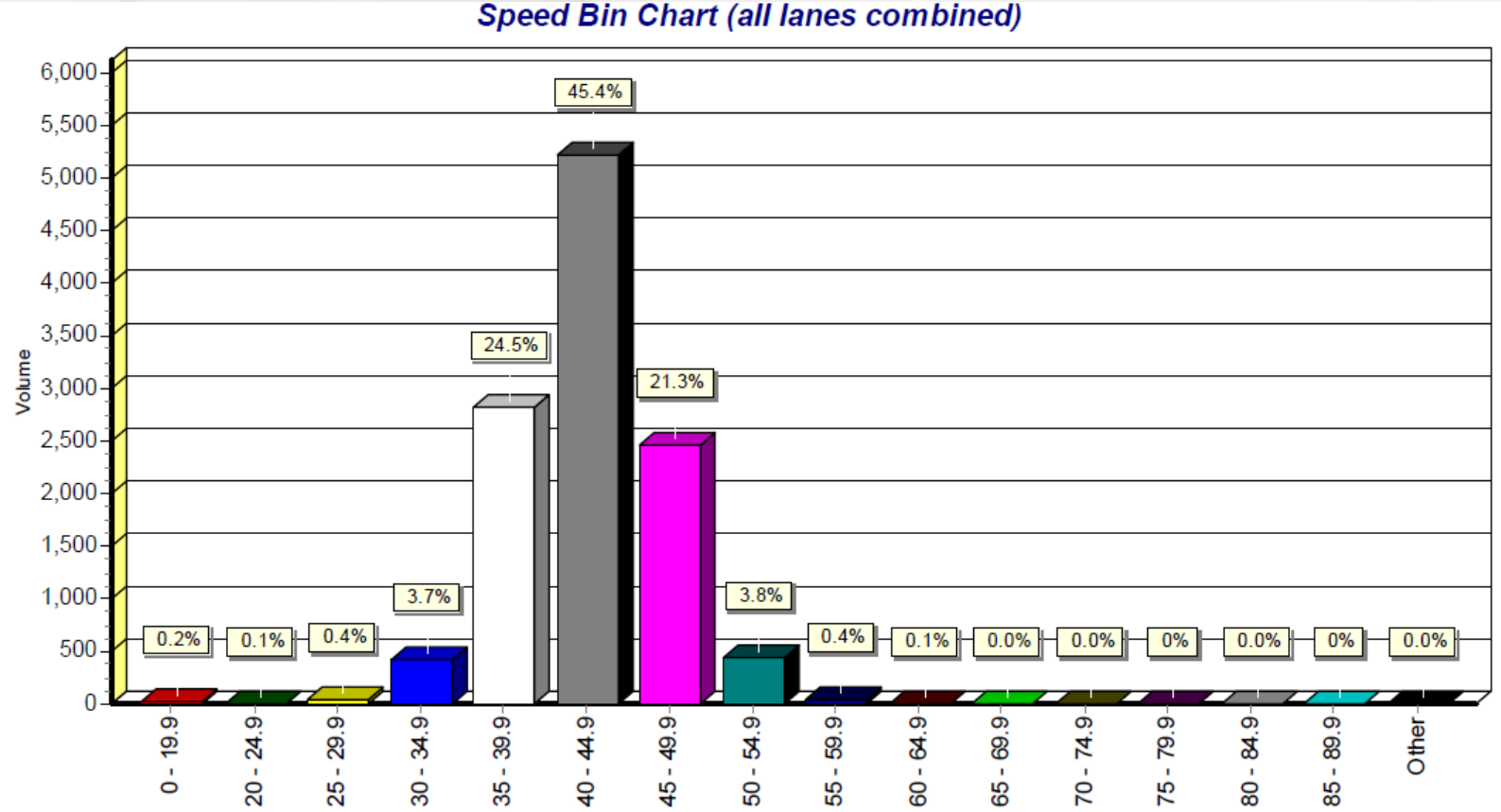
Candia, NH Route 27 Traffic and Engineering Investigation



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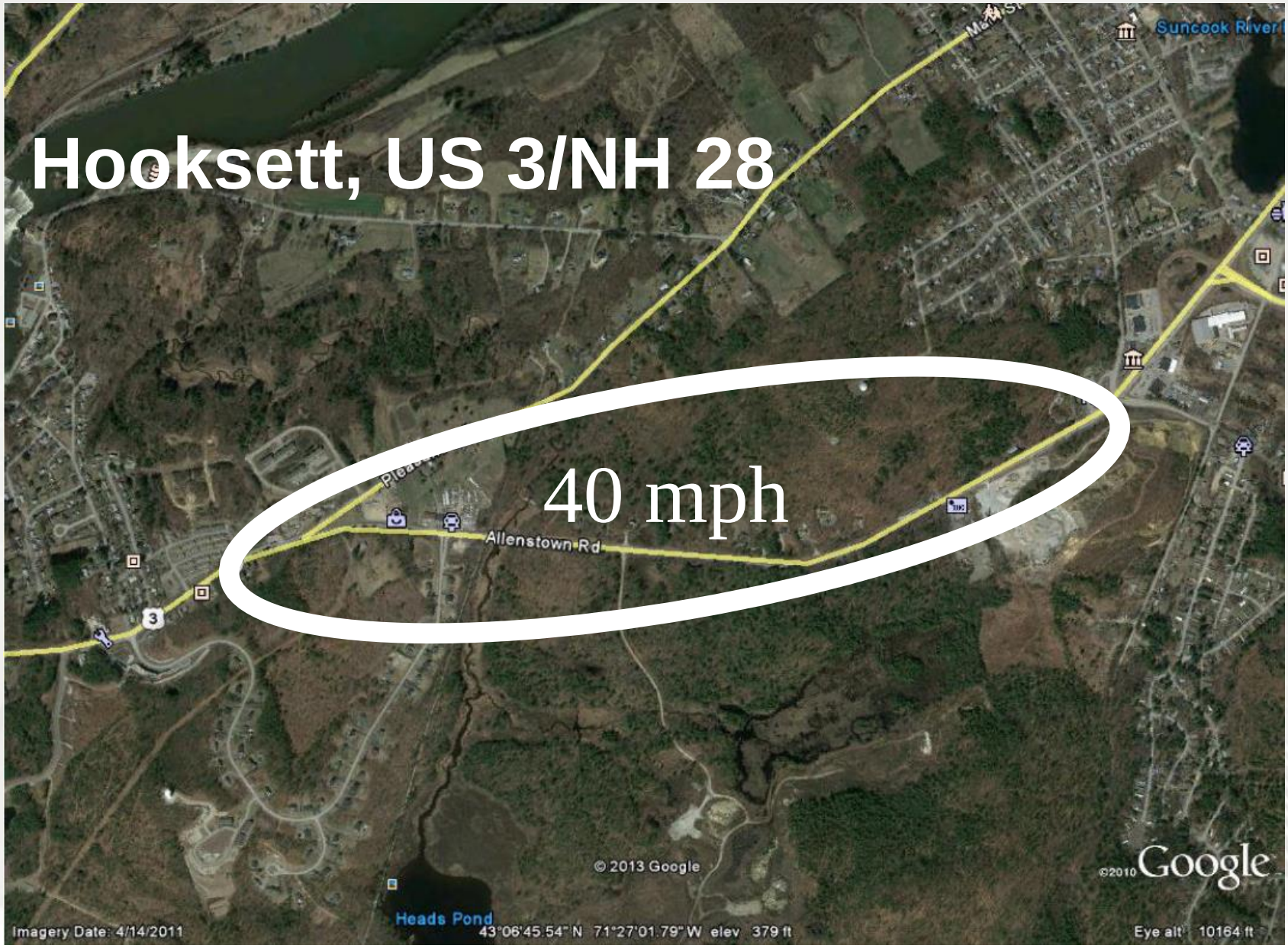

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STEPHEN G. PERNAW & COMPANY, INC.
PROJECT: US RT 3 & NH RT 28 (0.3 miles North of Greens Marine, Hooksett, NH)
NUMBER: 1024A
POSTED SPEED LIMIT: 40 mph

SPOT SPEED SURVEY

Day	Date	Mean Speed (mph)	85th Percentile (mph)
Mon	5/22/06	52.85 mph	58.12 mph
Tue	5/23/06	52.33 mph	57.54 mph
Wed	5/24/06	52.31 mph	57.47 mph
Thu	5/25/06	52.74 mph	57.96 mph
Fri	5/26/06	52.62 mph	57.78 mph
Sat	5/27/06	53.28 mph	58.49 mph
Sun	5/28/06	50.92 mph	56.04 mph
AVG		**52.44 mph**	**57.63 mph**

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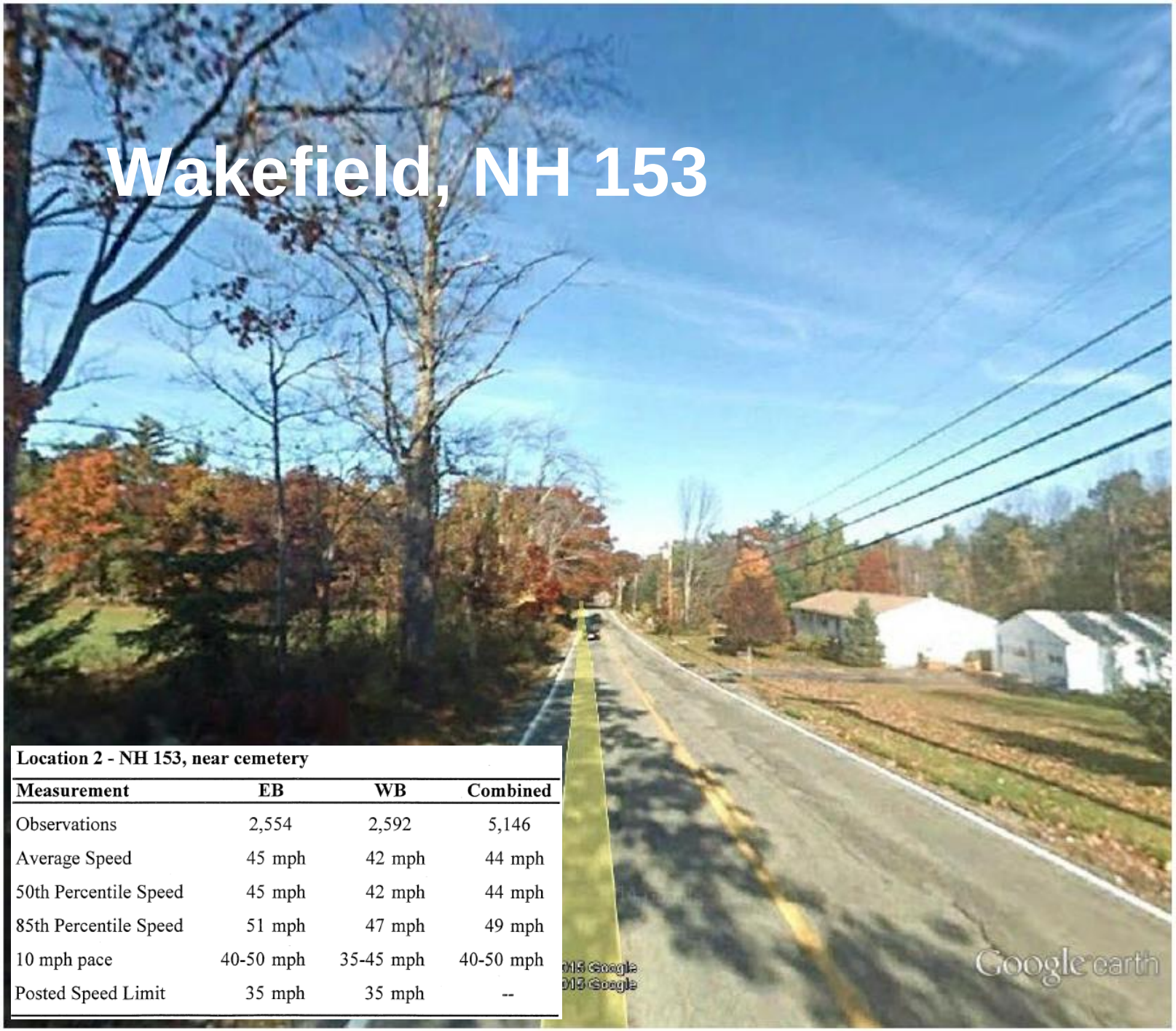
Wakefield, NH 153



Location 2 - NH 153, near cemetery			
Measurement	**EB**	**WB**	**Combined**
Observations	2,554	2,592	5,146
Average Speed	45 mph	42 mph	44 mph
50th Percentile Speed	45 mph	42 mph	44 mph
85th Percentile Speed	51 mph	47 mph	49 mph
10 mph pace	40-50 mph	35-45 mph	40-50 mph
Posted Speed Limit	35 mph	35 mph	--

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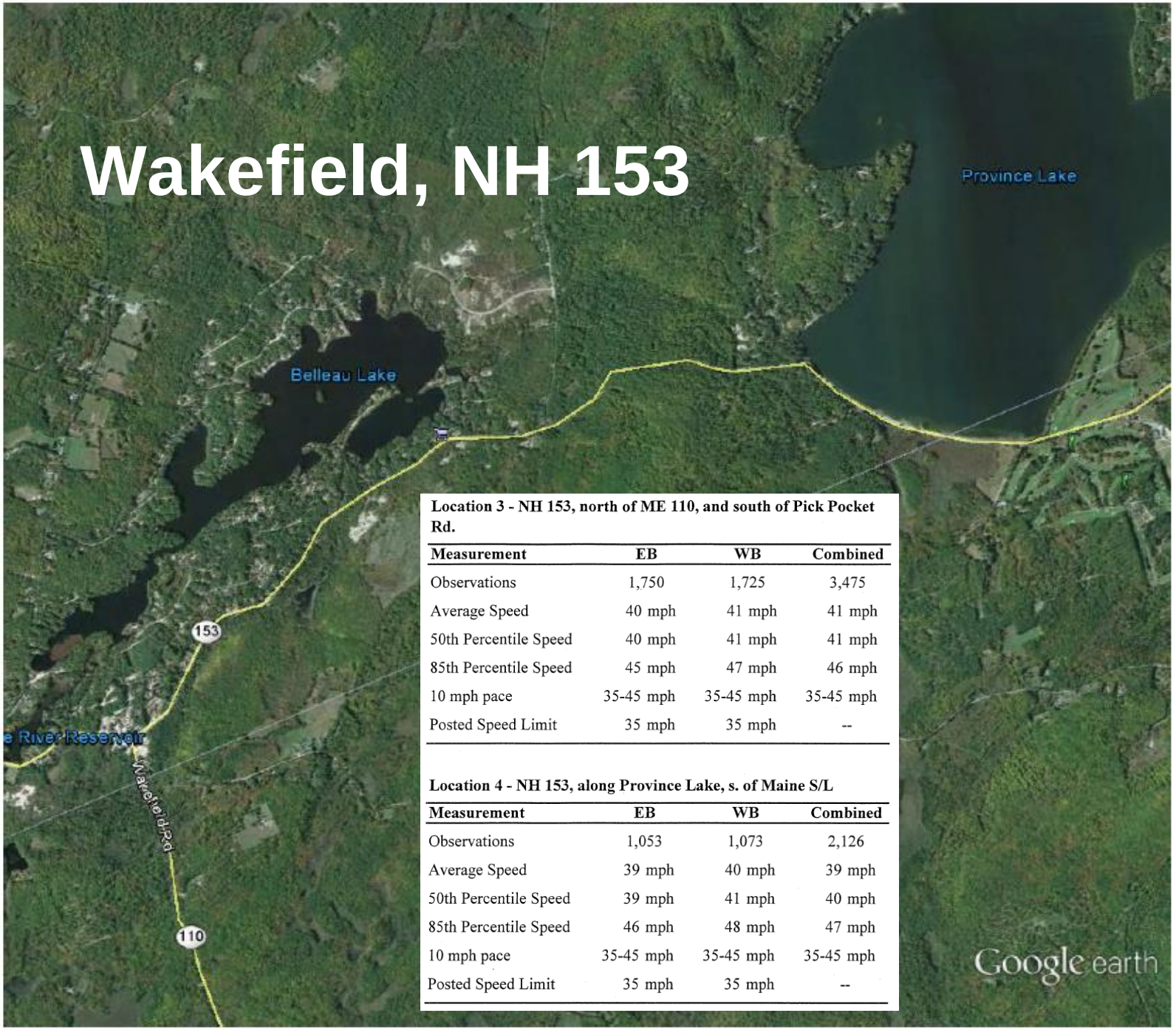
Wakefield, NH 153



Location 3 - NH 153, north of ME 110, and south of Pick Pocket Rd.

Measurement	EB	WB	Combined
Observations	1,750	1,725	3,475
Average Speed	40 mph	41 mph	41 mph
50th Percentile Speed	40 mph	41 mph	41 mph
85th Percentile Speed	45 mph	47 mph	46 mph
10 mph pace	35-45 mph	35-45 mph	35-45 mph
Posted Speed Limit	35 mph	35 mph	--

Location 4 - NH 153, along Province Lake, s. of Maine S/L

Measurement	EB	WB	Combined
Observations	1,053	1,073	2,126
Average Speed	39 mph	40 mph	39 mph
50th Percentile Speed	39 mph	41 mph	40 mph
85th Percentile Speed	46 mph	48 mph	47 mph
10 mph pace	35-45 mph	35-45 mph	35-45 mph
Posted Speed Limit	35 mph	35 mph	--

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Hancock, US Route 202

Location	Posted speed limit (mph)	85th percentile speed (mph)
South of NH 123	45	55
Between NH 123 and Forest Road	55	62
Through Forest Road	40	56
South of NH 137	50	54

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Lincold-Livermore, NH 112 (a.k.a. Kancamagus Highway)

Table 1 - Speed Summary Data
Lincoln - NH 112, east of Pollard Rd.

Measurement	EB	WB	Combined
Observations	13,440	13,338	26,778
Average Speed	45 mph	46 mph	46 mph
50th Percentile Speed	46 mph	47 mph	46 mph
85th Percentile Speed	**52 mph**	**53 mph**	**52 mph**
10 mph pace	40-50 mph	40-50 mph	40-50 mph
Posted Speed Limit	40 mph	40 mph	--

Table 2 - Speed Summary Data
Lincoln - NH 112, near Otter Rocks pull-off

Measurement	EB	WB	Combined
Observations	5,372	5,329	10,701
Average Speed	46 mph	48 mph	47 mph
50th Percentile Speed	47 mph	49 mph	48 mph
85th Percentile Speed	**54 mph**	**54 mph**	**54 mph**
10 mph pace	40-50 mph	45-55 mph	45-55 mph
Posted Speed Limit	40 mph	40 mph	--

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Wilmot, NH 4A speed study

Table 1 - Speed Summary Data
Wilmot NH 4A between Stearns Rd and Granite Hill Rd (35 mph)

Measurement	NB	SB	Combined
Observations	3,547	3,580	7,127
Average Speed	46 mph	44 mph	45 mph
50th Percentile Speed	46 mph	44 mph	45 mph
85th Percentile Speed	**52 mph**	**51 mph**	**52 mph**
10 mph pace	40-50 mph	40-50 mph	40-50 mph
Posted Speed Limit	35 mph	35 mph	--

Speed data collected: Saturday, September 21 to Wednesday, October 2, 2019.

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Speed Limit Relationship to Other Traffic Control Devices

Passing Zones

Curve Warning Signs

Pedestrian Crossings

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Speed limit relationship to other traffic control devices

- Passing zones
  - Required passing sight distance is a function of the posted speed limit:

Table 3B-1. Minimum Passing Sight Distances for No-Passing Zone Markings

85th-Percentile or Posted or Statutory Speed Limit	Minimum Passing Sight Distance
25 mph	450 feet
30 mph	500 feet
35 mph	550 feet
40 mph	600 feet
45 mph	700 feet
50 mph	800 feet
55 mph	900 feet
60 mph	1,000 feet
65 mph	1,100 feet
70 mph	1,200 feet

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Speed limit relationship to other traffic control devices

- Curve warnings:

Table 2C-5. Horizontal Alignment Sign Selection

Type of Horizontal Alignment Sign	Difference Between Speed Limit and Advisory Speed				
	5 mph	10 mph	15 mph	20 mph	25 mph or more
Turn (W1-1), Curve (W1-2), Reverse Turn (W1-3), Reverse Curve (W1-4), Winding Road (W1-5), and Combination Horizontal Alignment/Intersection (W10-1) (see Section 2C.07 to determine which sign to use)	Recommended	Required	Required	Required	Required
Advisory Speed Plaque (W13-1P)	Recommended	Required	Required	Required	Required
Chevrons (W1-8) and/or One Direction Large Arrow (W1-6)	Optional	Recommended	Required	Required	Required
Exit Speed (W13-2) and Ramp Speed (W13-3) on exit ramp	Optional	Optional	Recommended	Required	Required

Note: Required means that the sign and/or plaque shall be used, recommended means that the sign and/or plaque should be used, and optional means that the sign and/or plaque may be used.

See Section 2C.06 for roadways with less than 1,000 ADT.

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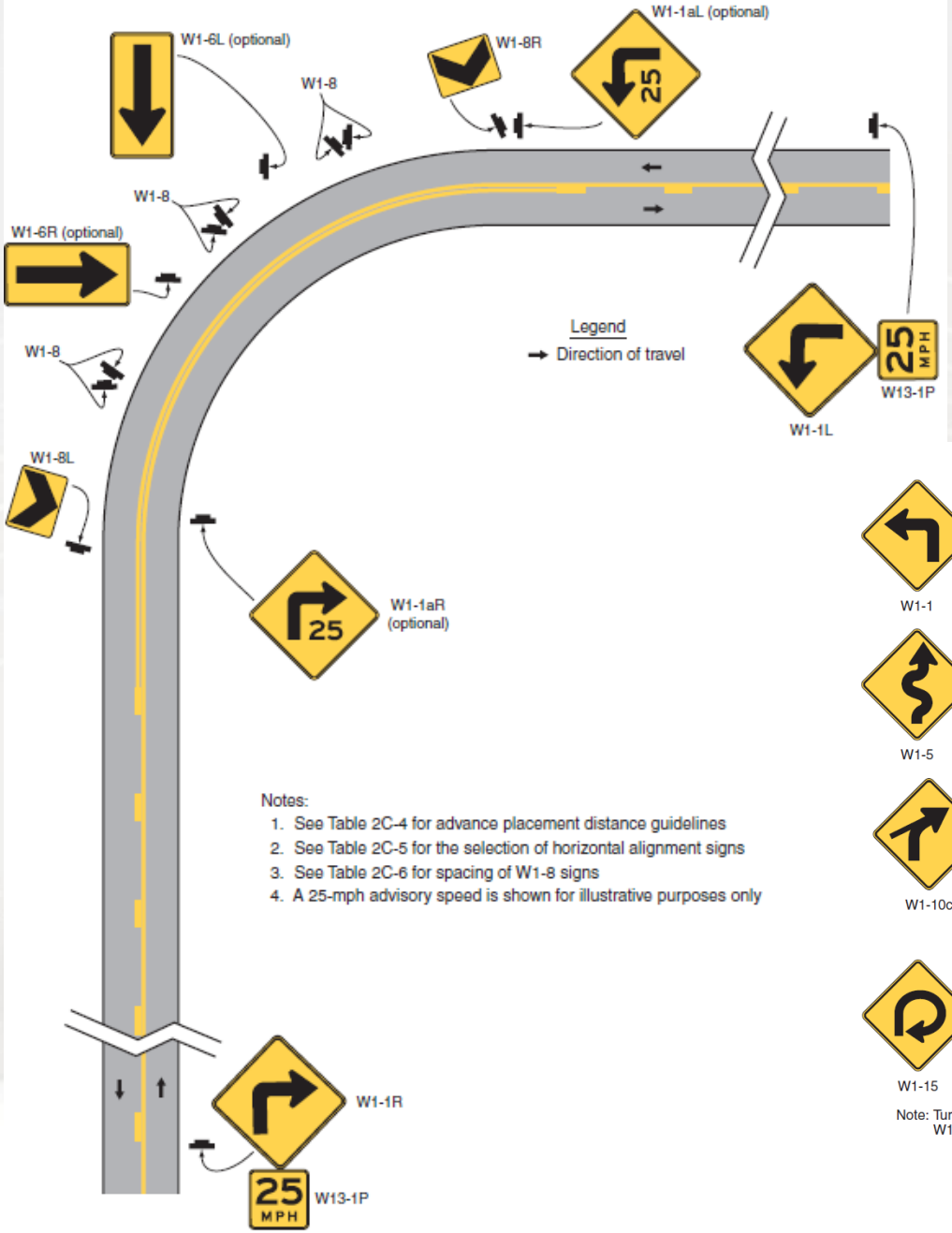
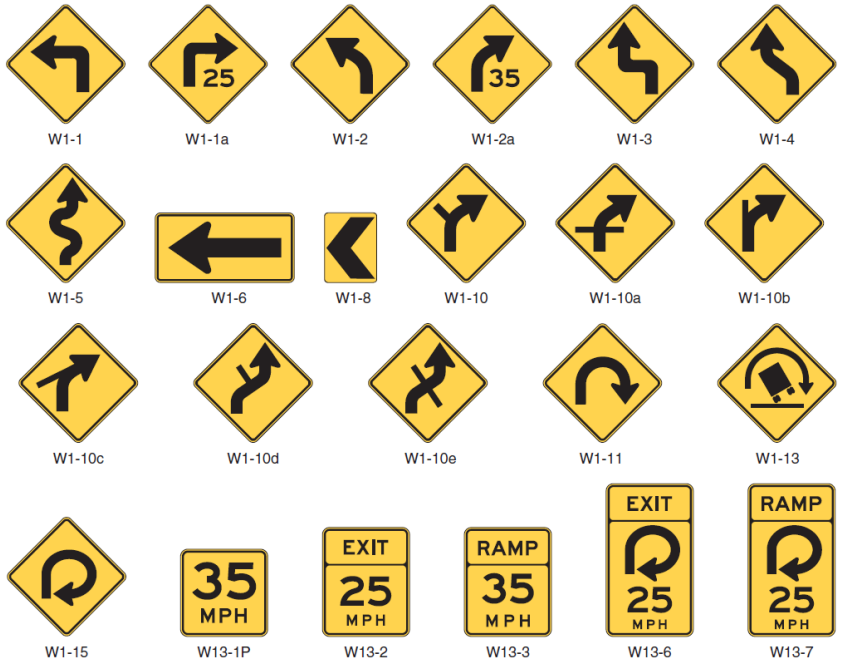
Figure 2C-2. Example of Warning Signs for a Turn



Notes:

1. See Table 2C-4 for advance placement distance guidelines
2. See Table 2C-5 for the selection of horizontal alignment signs
3. See Table 2C-6 for spacing of W1-8 signs
4. A 25-mph advisory speed is shown for illustrative purposes only

Figure 2C-1. Horizontal Alignment Signs and Plaques



Note: Turn arrows and reverse turn arrows may be substituted for the curve arrows and reverse curve arrows on the W1-10 series signs where appropriate.

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Questions?

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